tarded considerably the introduction of ventilation in ordinary apartments, is the idea that some special force or power is required for this purpose. It is true, indeed, that a power is required; but nature has provided this power in the movements which the warmth of the person necessarily induces in the air which it vitiates; and hence, if the natural movements of vitiated air in ordinary apartments be not opposed and resisted by the absence of apertures at those levels where air, if left to itself, will enter or escape, the discharge of vitiated air upwards by ordinary currents is as fixed and certain as the descent of water by its natural gravity in draining operations; and, if a modification be induced in apartments by kindling a fire, still, if the chimney-flue be not excessive in size, and an adequate supply be given for it, as well as for superior ventilation, these natural movements will be sustained, and proceed in harmony with the functions of the system.

Apertures such as are now adverted to may not command the extended movements that give the most complete ventilation that machinery, furnaces, and other arrangements can sustain; they may be rendered more or less irregular by the action of the wind; but, without inducing severe draughts, they will remove the extreme evil that induces so large an amount of weakness, disease, and death, and it is this result that is necessarily most important to society.

It is also important to know that mere openings operate in another way than by facilitating ordinary currents, according to the relative pressure within and without in any apartment, though this second mode of action is to be regarded principally as an auxiliary force, in respect to its power of changing the atmosphere in any apartment, however important its functions may be, where the air comes in direct contact with the living frame. So careful has nature been in the securities taken to prevent any stagnation of air around the person, that, besides the movements dependent on an alteration of the specific gravity of each successive portion of air that is received into the lungs, or brought in contact with the surface of the body, a power of penetration, revealed in modern times more especially by the experiments of Dalton and Graham, is found to be incessantly in operation, promoting natural ventilation, and discharging vitiated air from every place in which it is prone to accumulate. This force operates in every direction with a power superior to that of the pressure of the atmosphere, and its tendency is slowly to diffuse all gases and vapours through each other, whatever may be their difference in specific gravity; its action is never arrested except where air-tight barriers are interposed between one portion of the atmosphere and another. Hence, then, where internal and external temperatures approximate so closely as to reduce the movements that commonly ensue between the atmosphere within and that without, and even where they may be reversed (as when a higher temperature prevails externally than is found within), still the power of penetration between the particles of different gases or vapours never ceases to reduce the intensity with which they may be prone to accumulate in any individual place, provided a communication be maintained between it and the external atmosphere.

HOLBORN AND FINSBURY COMMISSION.

TENDERS for new sewers.—Copenhagen-street, White Conduit Fields: length, 1,000 feet; surveyor's estimate, 852*l.*

G. Smith (Bayswater)	£1,018 15
Hill	1,012 0
Johnson	996 0
Cooper	940 0

Gray's Inn-lane, &c.: length, 800 feet; estimate, 816*l.*

Cooper	£1,020 0
Eldred	975 0
Ward and Son	922 0
Hill	905 0
G. Smith	787 11

Red Lion-street, Clerkenwell: length, 480 feet; estimate, 440*l.*

Hill	£560 0
Cooper	554 0
Johnson	548 0
G. Smith	460 19

THE TOOLS AND IMPLEMENTS OF INDUSTRY AND ART.

A LECTURE on the above important and interesting subject was delivered on Thursday, 21st inst., at the City of Westminster Literary and Scientific Institution, Great Smith-street, by Mr. Wm. Higgs. The lecturer commenced by observing, that man was distinguished by the possession of the inventive faculty, by the proper exercise of which he is enabled to administer to the comfort and happiness of himself and all by whom he is surrounded. The mechanical powers, the means whereby muscular force is augmented and man is enabled to perform with ease many things, of which his unassisted strength would be quite incapable, were next glanced at, and an experiment or two given in illustration. Hunt's Patent Receiving Box was also alluded to as an ingenious and useful invention, illustrating the employment of the lever.

Having taken a brief view of the progress of the building art from the most primitive hut to the convenient dwelling and the elegant and stately mansion, the lecturer next commenced a detailed examination of some of the implements by which that art had been advanced to its present state. The spade first engaged attention; the properties of a good one were described, and the audience put on their guard against the spurious, but good-looking article formed by rolling, &c. The axe was then described, and its varieties exhibited, with notices of ancient instruments of this kind, of stone, and subsequently of an alloy of copper, as preceding the use of iron and the more improved steel-edged and steel-polled axe and adze of the present day: the Canadian, or Backwoodsman's axe, from its formidable appearance, excited much interest. After detailing the manufacture of these important tools, the hammer was noticed, and many of its varieties submitted to the inspection of the audience. The delicate hammer of the watch-maker, weighing together with its handle not more than 140 grains, was contrasted with the metal helve of our ironworks, weighing seven or eight tons, a diagram of which and of the tilt hammer made their mode of operation easily understood; the sledge of the smith, and the highly-wrought and beautifully polished planishing hammer of the silversmith were also examined. A form of mallet, differing from that in use by the carpenter, was also suggested, as having its weight so concentrated as to strike a heavier blow with less expenditure of labour.

The saw was described as an instrument of great importance, both as regards facility of operation and economy of material; its history and high antiquity were noticed, and its principal varieties submitted to inspection in a number of most beautiful and highly-finished specimens. The manufacture of saws was described as calculated to call into operation the skill and ingenuity of first-rate workmen. The properties of a good saw were thus described: "It should not be so thick as to be heavy or clumsy, nor so thin as to be easily crippled by fair use; the plate should be equally ground, not gouty or thick in the middle, for then it will require too much set, but if it gradually taper from the teeth to the back it will work with the smallest amount of set to the saving of wood and labour; it should not be too hard, but be capable of being filed, nor to soft, for then it will not retain its edge; upon examination, it should not discover any weak or crippled part, but all the particles should have an equal tension." A tool not much known but very useful was noticed, the flote, as intermediate to the saw and file. The antiquity and importance of the file also claimed attention. File-cutting was described, as also the subsequent process of hardening; many beautiful varieties were exhibited, some of the most exquisite workmanship, and some so exceedingly small as to bear a value of 2*l.* per ounce.

NEW RAILWAY BREAK.—The Rev. F. H. Maberly, of Stowemarket, has lately obtained a patent for a break, by means of which he states, "every carriage of a whole train may be easily, safely, and almost instantaneously stopped," and further, that "if applied in all parts, it will be the means of preventing the carriages being thrown off the lines by oscillation or otherwise."

THE OLD CHURCH AT FULHAM.

THE venerable tower of Fulham church, adjoining the palace of the Bishop of London, has long called for restoration: brickwork capped with Yorkshire paving formed the battlements, the turret was stunted, the belfry windows, strings, and plinth, were tumbling to pieces, and the great west window had disappeared altogether, and was boarded up. Partly by a rate, and partly by subscription, funds have been raised, and the work is now rapidly proceeding, under the direction of Mr. Godwin, the architect. His lordship the bishop, the Rev. Mr. Baker, the rector, John Gunter, Esq., and several other of the principal inhabitants of the parish, have exerted themselves to effect this restoration. Mr. Samuel Cundy, of Pimlico, is the contractor. When completed we shall give some account of the church, which has several points of considerable interest.

PROTECTION OF BUILDINGS FROM LIGHTNING.

THE effect of a thunder storm on the hothouses and frames of the Marquis of Lansdowne, at Bowood, has led to a correspondence on the subject of conductors in the *Mark Lane Express*. Mr. White, of Walworth, says:—"I am fully persuaded that if a range of conductors had been placed on the nearest rising ground, the severity of the storm would have been drawn off, and the noble marquis's property preserved in part, if not altogether. But it frequently happens that many mansions are provided with "numerous conductors," like those erected by Pope Pius VII. for the protection of St. Peter's at Rome, the cupola of which edifice is *cracked in many places*, and ten arches of iron, weighing 60,000 kilogrammes, have been placed so as to prevent its fall. The lanterino above the cupola, which supports the cross, is found to be cracked through and through, and has been surrounded by heavy iron chains to prevent the crack from extending. All this heavy iron they say is to *prevent mischief by thunder storms!* Now the fact that conducting rods judiciously placed will protect buildings from injury, is fully established, as shown by Dr. Franklin; but if numerous conductors be erected about the same building, it is evident that they will attract the passing storm to that focus, and there the elemental strife will rage; and again, the application of ten iron arches, and heavy iron surrounding chains, are sufficient to draw from the thunder clouds such a vast amount of the electric fluid as to shiver the building to atoms. We not unfrequently see a tall chimney, or a stack of chimneys, supported by slanting bars of iron fastened to the roof of the building. It commonly happens that the electric fluid will follow the slanting irons, and, not finding a free passage, frequently damages the room or the walls; and then the wonder is, how came the walls cracked? An architect is consulted, the foundation must be defective, and the walls must be shored up; whereas if the conductors had been simple, and there had been no lateral bars of iron, the walls might have stood for years uninjured. Conducting rods, if judiciously placed—that is, if they are properly insulated from the building—are great safeguards to the property under protection; but if placed in such a manner that a lateral discharge may come in contact with the building itself, they are then instruments of destruction rather than safeguards or protectors.

VIEWS IN SAXE COBURG AND GOTHA.—Mr. Hogarth, of the Haymarket, is preparing for publication a series of views of the ducal palaces, castles, and hunting seats in Saxe Coburg and Gotha, drawn on the spot, and lithographed by Douglas Murison. The work is announced under the patronage of the Queen and Prince Albert, and will be dedicated by permission to the Duke of Saxe Coburg Gotha.

ROYAL DUBLIN SOCIETY.—The appointment of drawing-master in the figure school of this society is at present vacant. Candidates are required to send in probationary drawings by the 25th of October next. The election will take place in the following month.

To learn more about PDF Compression and OCR visit ThePaperlessOffice.org